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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/851,461

05/08/2001

Hung-Hsiang Jonathan Chao

Poly-17/APP

3632

26479

7590

11/19/2004

STRAUB & POKOTYLO

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EXAMINER

MURPHY, RHONDA L

ART UNIT

PAPER NUMBER

2667

DATE MAILED: 11/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/851,461

Applicant(s)

CHAO ET AL.

Examiner

Rhonda Murphy

Art Unit

2667

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 34 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>05/08/01</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C.

121:

- I. Claims 1-33, drawn to a method for use in a multi-stage switch, classified in class 370, subclass 388.
- II. Claim 34, drawn to a machine readable medium, classified in class 370, subclass 392.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions I (claims 1-33) is directed to the method for use in a multi-stage switch; while invention II (claim 34) to a machine readable medium comprising identifiers and pointers, and further group I does not require the subject matter of claim 34 to be patentable.

3. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with John Pokotylo on November 10, 2004 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-33. Affirmation of this election must be made by applicant in

Art Unit: 2667

replying to this Office action. Claim 34 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

1. Claim 17 is objected to because of the following informalities: A period is required at the end of the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Hughes et al. (US 6,747,971).

Art Unit: 2667

Regarding claims 1,2,11,17,18 and 27, Hughes teaches a combination for use in a multi-stage switch, the combination comprising: a) a plurality of central modules (Fig. 3, modules **309a-309h**), each including outgoing links towards output modules (**egress ports 306a-306n**) including a plurality of output ports (**ports 1-14**); b) a plurality of input modules (**ingress ports 304a-304n**), each including i) virtual output queues (**312a-312n and 313**), and ii) outgoing links coupled with each of the plurality of central modules (shown as lines between ingress ports and 309); and c) means for matching a non-empty virtual output queue of the input module with an outgoing link in the input module (col. 6, lines 64—67; col. 7, lines 1-4); and d) means for matching the outgoing link of the input module with an outgoing link of one of the central modules (col. 6, lines 10-15), wherein high switch throughput can be achieved without speedup of the central modules; means for matching a non-empty virtual output queue of an input module with an outgoing link in the input module include: i) means for broadcasting (col. 3, lines 66-67; col. 4, lines 1-2) a request for the non-empty virtual output queue to an arbiter (Fig. 3, **request controller 314**) for each of the outgoing links of the input module (col. 6, lines 41-44); ii) for each of the outgoing links of the input module, an arbiter for selecting a non-empty virtual output queue that broadcast a request (col. 4, lines 24-26 ; iii) means for sending a grant to an arbiter for the selected non-empty virtual output queue (col. 4, lines 26-28); and iv) for the selected non-empty virtual output queue, an arbiter for selecting an outgoing link from among the one or more outgoing links that sent a grant (col. 4, lines 28-30).

Art Unit: 2667

Regarding claims 3,12,19 and 28, Hughes teaches means for matching a non-empty virtual output queue with an outgoing link in the input module within one cell time slot (col. 6, lines 54-58,63-67).

Regarding claims 4,13,20 and 29, Hughes teaches the arbiter of each of the outgoing links of the input module for selecting a non-empty virtual output queue that broadcast a request, includes a pointer (col. 4, lines 59-64) updated in accordance with a round robin discipline (col. 3, lines 44-47).

Regarding claims 5 and 14, Hughes teaches the act of selecting, with the arbiter of each of the outgoing links of the input module, a non-empty virtual output queue that broadcast a request, is done in based on the location of a pointer updated in accordance with a round robin discipline through each of the virtual output queues of the input module (col. 18, lines 3-10).

Regarding claims 7,16,22 and 31, Hughes teaches the acts of i) broadcasting a request for the non-empty virtual output queue to an arbiter for each of the outgoing links of the input module; ii) selecting, with the arbiter of each of the outgoing links of the input module, a non-empty virtual output queue that broadcast a request; iii) sending a grant to an arbiter for the selected non-empty virtual output queue; and iv) selecting, with the arbiter of the selected non-empty virtual output queue, an outgoing link from among the one or more outgoing links that sent a grant, are performed at least twice within one cell time slot (col. 6, lines 27-33).

Regarding claims 8 and 23, Hughes teaches the means for matching the outgoing link with an outgoing link of one of the central modules include: i) means

Art Unit: 2667

for broadcasting a request for the outgoing link of the input module to an arbiter for each of the outgoing links of the central modules that lead towards an output port associated with the virtual output queue matched with the outgoing link of the input module (col. 7, lines 16-24); ii) for each of the outgoing links of the central module, an arbiter for selecting an outgoing link of the input module that broadcast a request (col. 8, lines 10-12); and iii) means for sending a grant to the selected outgoing link of the input module (col. 7, lines 44-47).

Regarding claims 9 and 24, Hughes teaches the act of selecting with the arbiter of each of the outgoing links of the central module, an outgoing link of the input module that broadcast a request, is done based on a round robin discipline (col. 3, lines 44-47).

Regarding claim 10, Hughes teaches the act of selecting, with the arbiter of each of the outgoing links of the central module, an outgoing link of the input module that broadcast a request, is done in based on the location of a pointer updated in accordance with a round robin discipline through each of the outgoing links of each of the input modules (col. 18, lines 3-8).

Regarding claim 25 and 32, Hughes teaches k input modules (Fig. 3, 304a-304n), each having n input ports (312a-312n plus 313), $n \times k$ virtual output queues (312a-312n, 313 x 304a-304n), and m outgoing links (315a-315h).

Regarding claim 26 and 33, Hughes teaches $n \times k$ virtual output queues of each input module are grouped into k groups (304) of n virtual output queues (312 plus 313).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6,15,21 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hugh et al. (US 6,747,971).

Regarding claims 6,15,21 and 30, Hughes teaches the pointer moving through groups of virtual output queues. Hughes fails to explicitly teach the pointer moving through groups of virtual output queues before moving through virtual output queues within each group. However, it is obvious to one skilled in the art that if a pointer is capable of moving through groups of output queues, it is thus capable of moving through each of the groups before moving through the entire group.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

* Lau et al. (US 6,625,121) discloses dynamically delisting and relisting multicast destinations in a network switching node.

* Charny et al (US 6,072,772) discloses a method for providing bandwidth and delay guarantees in a crossbar switch with speedup.

Art Unit: 2667

* Chiussi et al (US 5,689,506) discloses multicast routing in multistage networks.


* Cordell et al (US 5,367,520) discloses a method and system for routing cells in an ATM switch.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rhonda Murphy whose telephone number is (571) 272-3185. The examiner can normally be reached on Monday - Friday 8:00 - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

rlm


RICKY NGO
PRIMARY EXAMINER